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A Dissertation on

Fever.

By

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of

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W. R. H.

The following observations on the identity of fever and the treatment of its various forms are respectfully submitted to the Faculty of the University of Pennsylvania, in obedience to the laws of that Institution.

I have chosen this subject knowing it to be a difficult question, and one which has employed much of the learning and talent of the Medical Profession, even from the time of Hippocrates, nor have we yet succeeded in pointing out the causes, locality & treatment of the different phænomena produced by febrile agents and exhibited in the course of disease. — So long as there is a discrepancy of opinion among authors, with regard to any subject, all cannot be right.

If these men, who are endowed with superior mental ability & who have had the advantage of a well regulated course of instruction, who have enjoyed every opportunity for the cultivation of the science of Medicine, connected with the most extensive Hospitals,

Infirmaries and Armies, and in the most sickly parts of the world, disagree as to the nature and origin, and locality of the febrile agent, the different laws which modify its actions; if men endowed with the noblest faculties of human nature, who have shed a light on every other branch of the science, yet have not been able, with their united genius, & application, to illustrate this subject, it may appear vain in me to attempt a solution of the difficulty, or to throw an additional light on this obscure point in Medical Science. —

Without indulging such a hope, I have chosen this subject, more with a view of making myself more thoroughly acquainted with it than I would otherwise become. I am fully convinced that I cannot make myself too fully acquainted with all that relates to it, and this, it is hoped will be a sufficient excuse, (if any be necessary) for my apparent attempt to grasp at things beyond my reach. —

The successive hypotheses prevailing through a long period of Medical history, have been numerous,

and they present to us fanciful notions, more crude and visionary than the opinions of the ancients generally with regard to other subjects.

They lived at a period called, by them, the scientific age, but by us the morn or dawn of Science; and we imagine we have arrived at the meredian splendour of Science, but may not the lapse of a few centuries expose the fallacy of principles now deemed incontroventible? There is a possibility of this; let us not, therefore, censure our predecessors too severely, lest we be censured in our turn. — The agent producing febrile affections is now thought to be produced by a decomposition of animal & vegetable matter, from the circumstance of fevers being more prevalent in those districts where animal and vegetable matter are undergoing a decomposition: we attribute it to this cause; but of its existence we have no knowledge, with the exception of the effects which it produces. As to its constituent or elementary principles

we are ignorant, and what we take for granted is, that a noxious ethreal fluid is generated. It is said by some, miasmata may be generated from a variety of sources, but this I am not willing to admit: for if we take into consideration that the constituent and elementary principles of the earth are few in number, we shall find that there are but few sources for the origin of this peculiar compound.

Miasma is a generic term meaning a gen=erated ethreal fluid, which, when applied to the system, under peculiar conditions, is capable of producing febrile affections.— By some it is thought that stagnant water produces Miasma, but we know that water is indestructible and cannot be any thing more or less than an agent, or menstruum, in the production of Miasma. It is necessary that a certain degree of moisture and heat exist at the same time for the production of this noxious vapour.—

We know that it is well ascertained that most, if not all, kinds of vegetable matter, when deprived

of their water by baking, or by any other process & kept perfectly dry, will remain undecomposed for an indefinite time. — There are other cases in which organic matter is much more susceptible of decomposition & in which moisture & a common degree of temperature are sufficient to resolve them into their constituent principles, or to change the order of their components & produce new compounds.

It must be evident to every one that the vaporation of pure water cannot prove noxious to a healthy system, as is proved by the evaporation which takes place during winter, at this season there is little or no animal or vegetable matter undergoing decomposition, as the heat at this time is not sufficient to excite decomposing influence — The atmosphere at this time is loaded with aqueous vapours. Evaporation takes place from the large Lakes and from the surface of the Ocean & no fever is engendered by inhaling the atmosphere at such a distance from the shore that the sea and land air cannot be mingled. — It is also pretty evident that the decomposition of vegetable matter

alone, is not always a source of fever. – Let us for a moment consider the immense quantity of luxuriant foliage annually clothing the forest which at the approach of autumn leaves its verdure and undergoes decomposition, which alone would produce fevers all over the world, were it capable of so doing without the aid of the last quantity of other vegetable matter which, under the most favourable circumstances, combined with a sufficiency of moisture & aided by a scorching sun, we see in the farm yards, without being able to excite fevers. If vegetable decomposition alone could produce this effect, we would necessarily have fevers in their most malignant forms in every forest and every farm at the approach of summer. We know that no people are more exempt from febrile affections than our forestial inhabitants, remote from situations where agriculture is extensively practised.

It is also my conclusion that the decomposition of animal matter is incapable of generating this noxious agent, & as a demonstrative proof of this we may cite the exhumations (conducted under the direction of

the Innocents) of the public burial ground, situated in one of the most frequented & populous parts of Paris, which had been used for the deposite of dead bodies, until the earth had become elevated six or eight feet above the common level and literally the dead were buried in the dead. The ground became so much impregnated with putrifying human remains, that the exhalation from the grounds became the source of public nuisance and excited in the minds of the people disgust & indignation. — The police taking advantage of this public feeling determined on the removal of this superstitious of human deposit.

At the commencement, which took place in the latter part of Autumn & was continued during the winter & early part of Spring, the greatest caution was observed, but no accident took place, although the labourers were almost stifled when breaking in upon a corpse, which had not undergone proper decomposition, by the gas arising in a concentrated state. And in the latter part no regard was paid to the season of the year, or any particular

caution observed & no fever was known to take place in any of the labourers engaged in that enterprise).

As a further evidence I cite the report made by — Berthe, professor at Montpelier, & two of his colleagues at that University, who were sent by the convention of France into Spain, to examine & report the nature of the Yellow Fever which had proved so fatal in several parts of Spain in 1800. — Bourg at Seville in five months after the epidemic had ceased: he states, in his report, that the burial ground in which the victims were placed is composed principally of clay, & the season being warm the ground cracked into wide & deep crevices through which foetid exhalations took place, in consequence of the decomposition which was going on in the mass of dead bodies.

Notwithstanding the large concourse of people that daily visited these burial grounds, some to gratify idle curiosity & others to testify their regard for departed friends. And after repeated examinations of the guards & grave-diggers stationed at these places, and from other sources equally claiming our confidence, not a

case of fever & ever known it to be replaced in consequence of breathing this atmosphere impregnated with exhalations of human decomposition.—

It leads to conclusion to my mind that the chemical constituents of this Terrestrial Globe are so strongly combined as not to be acted upon by the combined influences of a vertical sun & moisture without producing a substance evident to our senses and the chemist cannot detect it with all his nostrums.

It is true that the chemistry has never yet demonstrated the existence of Miasm, but it does not hence follow that such a principle does not exist.—

The hypothesis of its originating from subterraneous combustion, or from the appearance of Comets is altogether unfounded on any demonstrable facts with which we are acquainted.— Fevers always known immediately to precede or succeed the exhibition of these subterraneous phenomena, or the approach of Comets there would be some plausibility in the hypothesis; but we know that this is not the case. We have

fevers where there are no volcanoes or earthquakes or Comets & when these phaenomena are present we have no fevers & further they do not appear to any influence over, or aggravate the type of fevers, or any epidemics prevailing at the time of their appearance. —

(Here subterraneous combustion is capable of exciting fevers we should have them in Volcanoic districts, in every manifs & stage of aggravation ravaging the inhabitants until death releases the victims. But we do not find this to be the ——.

The composition of our planet and its products so far as we know, consists of but a very few principles. But the composition of these simples to form compounds produces powerful & astonishing effects and it does appear that the compound produced by the union of these simples owes its peculiarity as to its noxiousness or salubriousness in a direct ratio to the purity & quantity of the simples composing the compounds. And by the union of these simples in different proportions with each other we have all the different forms and

variety of matter known to our senses and all this difference of variety & form in the property of matter depends on an union of simples & quantity to form compounds.

The question now arises, from whence does this peculiar agent take its origin? We have attempted to prove that it cannot be produced from the vegetable or animal Kingdom, or from the evaporation of pure water & the earths' component principles, the appearance of Comets, Sublunaneous combustion &c. &c. We must originate them in consequence of the combined influence of the decomposition of animal and vegetable matter united by a sufficient quantity of moisture & heat &c.

Allow me, after much labour and patient investigation, we have attained this peculiar agent in the excitation of fevers. But we have now a task equally difficult in carrying it through the different avenues & locating it in the system & making it produce all the different forms of fever & phenomena attending them & when we have done this we may consider our task done. — All, I believe, agree in one particular

namely, that it is necessary for its application to some part of the system in order that it shall produce its full effects.

Experiments prove that there are but two ~~nasal~~ avenues through which this agent can enter the system, viz: the mouth and nose, from there to the lungs it becomes entangled with the saliva, whilst entangled in this passage & conveyed through the œsophagus to the stomach. Here I will take the liberty of reprimanding the vile practice of taking snuff & plucking out the hairs which grow in the cavity of the nose. The hairs acts an important part in the preservation of our health. They act the part of sentinels in preventing foreign matter from entering the lungs. If plucked out they fail to do this office, & if the owner of the nose is guilty of the vile practice of taking snuff, they become matted & perform their functions imperfectly.

We know that the sympathy existing between the lungs and stomach, & in fact all the system

is nothing in comparison to that which exists with regard to the Stomach & alimentary tube. We know that a derangement of this canal affects the system more or less in proportion to the extent & duration of derangement.

Whereas, the lungs may be affected to a considerable extent & even the larger portion may be a mass of disease & still the health be but little affected; the patients appetite & digestive organs are in a healthy condition & perform their functions in a ~~healthy~~ & natural manner, retaining his appetite & spirits to the last. It is true, he becomes pale, feeble & emaciated in the course of time, in consequence of the incapacity of the lungs in performing their functions. From this course of reasoning, we come to the conclusion, that it must be applied to the Stomach, & from thence extending through the alimentary canal affecting the organs engaged in the process of assimilation & sanguification.

We now have this peculiar agent in the imitation of fevers located in the stomach and

alimentary tube. A question arises with regard to its particular action on these organs. Does it act by part of a stimulus or that also excitable with just impression on the nerves? We are of the latter opinion from the effects first produced & much credit to our senses.

We, in most instances, after the application of this agent in the excitation of fever, a sensation below the mean temperature of a healthy system, sometimes more & sometimes less, with languor, listlessness of the mental & bodily energies, an indisposition to think & speak, & the recumbent posture, with more or less drowsiness, sometimes a disposition to sleep prevails, but is prevented by the predominance of a morbid irritability which harasses the patient & makes him wish for sleep, after which he pronounces himself a speedy recovery from his unpleasant sensations. But after a short repose, in nauseating sleep, he awakes with more or less anxiety & confusion of mind, the tongue & fauces are dry, thirst more or less urgent, which he attempts to allay by taking

times & repeated draughts of cold water.— Respiration becomes more or less hurried with some difficulty in breathing. The face is flushed, the eyes of a reddish muddy hue, the lacrymal gland is stimulated to increased action as proved by an increased flow of tears. The heart is stim-ulated to increased action. The arteries throb with more or less violence in proportion to the action of the heart.

The pulse is full & strong, bounding or chorded some proportion to the extent of local irritation, the velocity & sensibility of the part & the distance from the great centre of the sympathy, the stomach and alimentary canal; the healthy condition of which & its appendages are of more importance to the healthy condition of the system than any other organ, the brain, heart & lungs not excepted.

From this course of reasoning I am brought to the con clusion that all fevers originate from the same source & differ in no other respect from each other, than in the intensity & location & further I believe that nine tenths are gastro-enteritic affections & affections of the organs sub=

sidiary to the stomach & alimentary tube. And what constitutes the varieties of fevers is the location and intensity of affection & the different phenomena observed in febrile affections are owing to the intensity of the action of the organ affected & the sensibility of the seat of affection. We have seen that the indications of all fevers are nearly the same, and the sensibility of the same medical agents tends to establish this position.

In all fevers we have more or less nervous irritation in proportion to the concentration of the miasma, the time during which it is applied and the nature & extent of the surface to which it is applied. I have observed that it was my belief that the first impression on the system after the application of miasma, was that of diminished action in the heart. Congestion takes place in the first & consequence of irritation & the capillaries, the first parts we have congestion & inflammation in the stomach in proportion to the extent of surface affected.

We have no evidence that all fevers are not

disease. We have no evidence that the agent which excites intermitent or remitent, or that which excites Bilious or Yellow fever? — The fact is that one agent produces all the variety of fevers, the location intensity of action in the part, extent of surface affected, the organ affected, & the conditions of the nervous system at the time of affection. If the nervous system is in a deranged condition, or disposed to take a diseased action, we shall have nervous irritation in a direct proportion to the quantity of diseased action existing in the nervous system.

We shall next examine what disease is, and we shall find it to be an altered action in the part.

We are sensible of but two actions pervading the System, that of healthy and diseased, and every graduation from the healthy action constitutes a graduation in the quantity of disease. (If I may be allowed myself)

We will here ask the question, what is fever? & we shall find that it is nothing more or less than the effects produced by altered action in some particular parts of the system. And their effects will be

in a direct proportion to the extent and intensity of diseased action, the sensibility of the part or organ affected and the number of organs or parts implicated in the disease.

During the latter part of Spring, Summer and the commencement of Autumn, we have continued. Bilious fevers. During this period of time the miasma is generated in more abundance & consequently becomes more concentrated & capable of exciting more intense impressions on the system.

Hence the diseases are distinguished from each other by the part affected, & the intensity of the affection.

In continued fevers the Stomach is the seat of disease, in Yellow fever the stomach & duodenum is the seat of affection, differing in no other respect from continued fever than in intensity & extent of diseased action, & in Bilious fever the Liver appears to be more immediately the seat of diseased action. During the latter part of Autumn, winter & the early part of Spring we have Intermittents, remittents and Typhus fevers.

This artificial division will not always hold

good, for in many instances we have Intermittent & Remittent fevers prevailing during the latter part of Spring, Summer & the commencement of Autumn, but this variation can be accounted for satisfactorily by admitting that the miasma is not generated in a manner sufficient to produce the higher grades of fever & we have no hesitation in admitting this fact.

It may not here be amiss to take a survey of the people inhabiting the northern regions of Europe. Who, during a period of five, Six or Eight months retire to winter quarters, which consist of vaults sunk to the depth of Six or Ten feet below the surface of the earth, and thatched with canes. These apartments are small & each contains the members of five or Six families together with their Stock of provisions which consists of dried fish in various Stages of putrifaction. No air is permitted to enter their dwelling, except through a small hole in the top. They have no fire to dress their food or keep themselves warm, but the necessary warmth is kept up by pulmonary & cutaneous exhalation, a small lamp illuminals,

their habitations & here they eat, sleep & obey all the demands of nature, without the least restraint as to decency & what is astonishing, they enjoy good health & never complain of noxious atmospheres which they are constantly inhaling, notwithstanding they are exempt from contagious & typhus fevers. In accordance with the general belief, they should have typhus every winter. It does appear from the symptoms of typhus fever that it is produced by a different agent, but we cannot subscribe to this belief, as the same indications in the mode of treatment are observed.

I cannot help subscribing, in some degree, to the Brunonian doctrine & all our remedial agents in the treatment of febrile affections go to prove that doctrine which he so ably inculcates.

We have but one object in view in the treatment of all febrile affections, that is to restore healthy actions to the part affected and good government in the system.

As the arterial system is deranged in a direct ratio to the quantity of diseased actions & the nervous irritation is in a direct ratio to the extent & intensity of diseased

action in the part or organ affected & the sensibility of the part affected; in the treatment of all febrile affections we are to be governed by the severity and intensity of disease in these affections and by the effects produced by diseased action & the different symptoms & phenomena observed to point out the seat of diseased action.

The most conspicuous agent in restoring arterial action & government in the system is the Lancet & cold affusions.

These, as applied by some, are only to be used at the acme of the hot stage, but I am of opinion that they are serviceable at any period of the hot stage, so long as the skin is hot & dry & after this period I am not an advocate for their employment.

In all cases, in the application of our remedies due regard must be paid to the existing symptoms — Next in order are leeches, they gain their superiority over the scarification in point of convenience in application — We can apply them to any part of the system & any member, and to parts where the scarificator could not be used.

The scarificator & cupping glass come next in order

and in some particulars enjoy an advantage over the lancet in being applied nearer to the seat of the disease & by this means we are enabled to take blood from the diseased part, at a time when the strength of the system could not bear venesection, & leeches enjoy an advantage over lancet in this respect. — Next in order, in the treatment of febrile affections, are the saline purgatives effervescent and demulcent draughts. If the stomach is much deranged & will justify an emetic a mild one may be given, but if the state of the stomach & the brains does not justify the employment of an emetic it never fails to prove a source of aggravation & the degree of aggravation is in proportion to the extent of derangement of the brain & stomach and the mild or drastic action of the medicine employed.

Enemata are of the greatest importance in producing alvine evacuations, when the stomach will not permit the introduction of cathartics. Stimulating enemata may act by revulsion by establishing inflammation which acts by inviting to the part increased arterial & nervous action, and by this means the disease in the original part

is diminished & action & government are restored in the parts affected.

We have a diseased action generated in the part produced by continued stimulating menstra but the part affected is not disposed to continue the diseased action & as soon as we cease to apply stimuli the parts regain their healthy state.

Mercurial purgatives are of the quatest importance & are not to be neglected, they serve to establish functional action more specifically than any other agent with which we are acquainted. They also allay nervous irritation, in many diseases, more promptly than any other of our agents and particularly when given in combination with opium

We are to be governed here, as in every other case, by symptoms then prevailing in the system in selecting & using our remedies.

We have a variety of agents for allaying arterial action & nervous irritation but we are to be governed in our selections by the symptoms and

idiosyncracy of the system in applying those agents and in urging them to the proper extent, beyond which they may prove detrimental.

We are always to keep in view the alimentary tube & in the application of all our remedies to endeavour to restore health by action & government in those parts affected after which we employ a different class of agents in restoring the system to its former state of health. These are called tonics, from their agency in restoring a lost tone or strength to the suffering part, in the selection & employment of the remedies of this class, we must be governed, as usual, by the constitutional habits of the patient, the seat of the disease & other circumstances, which it is unnecessary to detail.

With regard to the particular articles of the Materia Medica to which the preference should be given, no unexceptionable rule can be formed. Calomel is undoubtedly the best evacuent of bile which is accumulated in the stomach & duodenum in febrile cases. But the great facility with which some patients become salivated is

an objection, in some instances, to the repeated exhibition of this article. In such cases calomel may be advantageously exhibited in combination with some vegetable cathartic such as jallap or rhubarb: castor oil also proves an excellent combination with calomel in cases where the stomach is irritated & we desire a prompt cathartic.

Of emetics the preference should be given to the tartrate of antimony. The activity of this emetic is such that I would recommend the exhibition of it in small & repeated doses until the effect is produced, rather than to prescribe a single dose & depend on that to produce the whole effect, & no more than might be desirable. Bloodletting should be premised in all cases in which there is inordinate arterial action

These evacuants, viz emetics, cathartics & diaphoretics when justifyable, should be continued as long as any indications remain of unhealthy nature in the stomach & intestines. If the evacuations assume a healthy appearance & the pulse continues high (a case that does not often occur) it may be reduced by the lancet. In these warm

bathing is very useful, not only in promoting the cutaneous evacuation, but also in assisting the operations of the cathartics & other evacuent medicines applied to the intestinal canal. In the exhibition of tonics, care must be taken that the stomach be prepared for their reception by being clear of acid secretions and free from morbid irritability. In hot climates & in cases in which the system has been much enfeebled by evacuations it may be necessary to exhibite tonics & stimuli before the febrile action has entirely disappeared. Under other circumstances, however, we will accomplish our ultimate object more satisfactorily by waiting for a perfect remission of the active symptoms before we exhibit a tonic. — As to the selection of a tonic we must be governed much by circumstances. We have many articles belonging to this class, among which it would be difficult to choose, without due regard to the idiosyncracy of the patient & other circumstances which are always present in the eye of the practitioner. We also meet, almost daily with cases in which the greatest

number of tonic medicines are rejected by the stomach, or effect the intestines in a pernicious manner.

I presume that I will be excused from entering into a detail of their several peculiarities & of the numerous cases in which they would be severally preferable. One remark, respecting their use appears to be too important to be neglected, viz: the tonics given for the purpose of restoring the system sometimes disappoint our expectations by inducing a debilitating diarrhœa (the peruvian bark particularly) or a constipation little less to be dreaded. It is, therefore, necessary to watch their effects, and to be ready with the proper remedies for the several influences which they may exert on the alimentary canal.

It is not necessary to remind the learned Faculty to whose judgment these remarks are submitted, that the limits of a thesis are too narrow for a full exposition of all the knowledge that a student may acquire on so prolific a subject of investigation as fever especially where he has enjoyed the unrivalled ad-

=vantages for the acquisition of Science, that are offered by the University of Pennsylvania.— What is here thrown together is respectfully submitted.

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